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ABSTRACT

This handbook outlines techniques and processes for improving institutional effectiveness and ensuring continuous quality improvement, based on strategic planning activities at Wisconsin's Milwaukee Area Technical College (MATC). First, institutional effectiveness is defined and 17 core indicators of effectiveness developed by the Wisconsin Technical College System are listed. This is followed by a discussion of continuous quality improvement, summarizing areas of management contributing to research and practice, the major elements of a customer-driven planning process, and the steps used by MATC in developing a plan for future improvement. The handbook then describes the following tools utilized by MATC to improve institutional effectiveness: (1) the effectiveness chart, detailing its seven components (i.e., indicators of effectiveness, evaluation methods, the relationship between the indicators and methods, the relationship between each of the methods, the relative importance of each indicator, and totals of improvement ratios and effectiveness values assigned in the chart) and providing specific examples; (2) the student contact point chart, providing a graphic representation of student-institutional contact to identify possible areas of improvement; and (3) the Error Mode and Effects Analysis method, used to evaluate the severity of problem areas and determine solutions. The remainder of the handbook discusses the development and implementation of a mitigation plan to deal with problem areas. Two blank effectiveness chart worksheets are appended. (TGI)

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ED 396 804

Institutional Effectiveness

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Milwaukee Area Technical College

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The staff, administration, faculty, and Board of Milwaukee Area Technical College are proud of the leadership that the institution has taken in the Continuous Quality Improvement process in higher education.

Applying a Continuous Quality Improvement model to assess Institutional Effectiveness is an example of an application of the tools of Continuous Quality Improvement. In my judgment, the handbook outlines in a clear, step-by-step process how the effectiveness of a college can be improved.

I am sure your journey in the process will be as exciting and rewarding as it has been at MATC.

John R Birkholz

John R. Birkholz
President

APPLYING A CONTINUOUS QUALITY IMPROVEMENT MODEL TO ASSESS INSTITUTIONAL EFFECTIVENESS

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Forward

This handbook is intended to show how the tools of Continuous Quality Improvement (CQI) may be used to focus the activities of a college or university. It has become evident over the last decade that outside influences form the direction of a college in subtle and not so subtle ways. We have been aware of the increasing attempts to apply the quality tools to institutional planning in order to clarify these various influences.

Our examples were chosen because they represent a real application of CQI which form a relationship between internal planning priorities and external influences and priorities. Although the Institutional Effectiveness indicators addressed here are an early form of the Wisconsin Technical College System indicators, any external standards or indicators may be used with this process.

The critical tool that we illustrate in this handbook is the Effectiveness Chart. It is our intention to move through the Effectiveness Chart in a step-by-step process so that the reader may understand both the calculations used and the reasons for those calculations.

The content and methods discussed in this handbook have grown out of the strategic planning activities at Milwaukee Area Technical College. We are currently in our third year of using the tools discussed and are pleased to share our interpretation of these applications with other colleges and universities.

We would like to thank Patricia Kreiter for her competence and invaluable assistance in editing and organizing this handbook.

It is our hope that you enjoy reading this handbook as much as we enjoyed writing it.

K. Roberts
J. B. Rieley

APPLYING A CONTINUOUS QUALITY IMPROVEMENT MODEL TO ASSESS INSTITUTIONAL EFFECTIVENESS

INTRODUCTION

This publication has been produced to illustrate how two driving forces in higher education can be harnessed by a college and used to encourage improvement and implement change. The two forces are:

1. Institutional Effectiveness (IE)
2. Continuous Quality Improvement (CQI)

INSTITUTIONAL EFFECTIVENESS

Institutional effectiveness really means "How well does a college do what it says it is going to do?" This is illustrated by the Western Association of Schools and Colleges (WASC) 1992 statement regarding institutional purposes, planning, and evaluation standards 2.c. The college is asked to provide evidence that:

> "The institution has developed the means for evaluating how well, and in what ways, it is accomplishing its purposes as the basis for broad -based continuous planning and evaluation."

The WASC encourages member schools to develop what is referred to as a "culture of evidence" concerning institutional planning and evaluation.

The North Central Association of Colleges and Schools (NCA) does not formally use the term "Institutional Effectiveness" but endorses institutional effectiveness in a de facto manner through Criterian Three which reads:

"The institution is accomplishing its purposes."

NCA states that in demonstrating that it meets Criterian Three "An institution will provide evidence of its effectiveness in accomplishing a variety of institutional purposes." The Commission further states; "While the Commission does not dictate methodology or instrumentation for this appraisal, it does expect rigorous assessment of institutional efforts and does require explicit documentation of student academic achievement."

For NCA, a subset of Institutional Effectiveness is the Assessment of Student Academic Achievement. Although other accrediting agencies may stress Institutional Effectiveness, currently, the NCA is focusing more on Student Academic Achievement.

ONE STATE'S RESPONSE TO INSTITUTIONAL EFFECTIVENESS

In late 1992 the Wisconsin Technical College Board, along with the State Technical College Presidents Association, proposed the development of a model for Institutional Effectiveness for the Wisconsin Technical Colleges. The Community College Consortium at the University of Michigan coordinated the efforts. The main objective was to " develop a comprehensive effectiveness model for adaptation within the context of the individual colleges."

A task force was assembled with representatives of the member colleges of the Wisconsin Technical College System working with many constituent groups to develop a definition of effectiveness, and the core indicators. Effectiveness was defined as:

> " An effective college is one that provides efficient educational programs and services that anticipate and respond to external and internal customer needs and result in outcomes that meet or exceed customer goals and expectations."

The task force developed 17 core indicators of effectiveness. They include:

I. Indicators of Employer Satisfaction
   - Employer satisfaction with graduates' work skills/performance.

II. Indicators of Student Achievement and Satisfaction
   - Identification of student needs, goals, and interests.
   - Identification of student functional skills at entry.
   - Course completion.
   - Student grades.
   - Student satisfaction with courses, programs, and services.
   - Student retention rates.
   - Student completion and graduation rates.
   - Student achievement of educational goal(s).
   - Student knowledge and skills at exit.
   - Pass rates/scores on licensure exams.
   - Placement rates/employment rates.

III. Indicators of Organizational Quality/Harmony/Efficiency
   - Achievement of institutional goals and standards.
   - Organizational climate.

IV. Indicators of Public Satisfaction
   - Articulation and linkages with external organizations.
   - Identification of customer needs and expectations.
   - Public satisfaction.

The next step in the process was to have each college develop its own effectiveness measurement procedure.

CONTINUOUS QUALITY IMPROVEMENT

Over the last several years the Total Quality Management (TQM) movement has moved unevenly into higher education. For our purposes, we will refer to this movement as Continuous Quality Improvement (CQI). Warren H. Schmidt and Jerome P. Finnigan summarize the areas of management study that have contributed to the study and practice of Continuous Quality Improvement.

- Scientific Management: Finding the best way to do the job.
- Group Dynamics: Enlisting and organizing the power of group experience.
- Training and Development: Investing in human capital.
- Achievement and Motivation: People get satisfaction from accomplishment.
- Employee Involvement: Workers should have some influence in the organization.
- Socio-technical Systems: Organizations take resources from their environments, modify them and add value, then put the products back into the environment.
- Organization Development: Helping organizations to learn and change.
- Corporate Culture: Beliefs, myths, and values that guide the behavior of people throughout the organization.
- New Leadership Theory: Inspiring and empowering others.
- The Linking-Pin Concept of Organizations: Creating cross-functional teams.
- Strategic Planning: Determining where to go, and how and when to go there.

Consciously and unconsciously, the implementation of CQI has used the above concepts. These can be applied to college and university planning using Hoshin planning techniques. The Japanese word "Hoshin" roughly translates to "shiny metal" which refers to the point of a compass, the part of the compass that shows the way. Hoshin planning is a key element of a customer-driven planning process. In the case of higher education, that would translate to a student need driven planning process.

The three major elements of a customer-driven planning process are: vertical alignment, horizontal coordination, and unit optimization.

Vertical Alignment

This refers to a college or university in which everyone "sees the same picture." There is a shared vision, a common focus. Without this "Vertical Alignment" there is lack of collective focus and a resulting waste of resources and misconceptions regarding institutional direction. The multiple political forces, both internal and external, pulling a college or university in differing directions tend to make vertical alignment difficult. It is our contention that broad participation, using quality tools, moves a college or university toward this vertical alignment.

Horizontal Coordination

This refers to the ability of a college or university to effectively function across division, school, college, and/or department lines. We believe that cross-functional teams, using quality tools, moves a college or university toward this horizontal coordination.

Unit Optimization

This refers to each component element of each college, school, division, and department working effectively toward the achievement of the college or university mission. We believe that the methods presented in this publication are the prerequisites for unit optimization.

Our college, a large urban technical college in the midwest, has used Hoshin planning techniques since the fall of 1992 to develop, implement and maintain its strategic plan. We have developed a vision for the future of our college. This vision, gave all areas of the college a central focus for developing a plan of how the college would move from where it was to where it intended to be.

What we have found to be important among the several steps in articulating this plan are:

- developing the indicators of progress toward the vision,
- validating the institutional mission,
- identifying the current trends affecting the college,
- determining and prioritizing customer needs,
- developing institutional strengths, weaknesses, and objectives,
- setting first-year goals and objectives,
- developing targets, responsibilities, measures of accomplishment, timelines, audit processes, and vehicles for the first-year goals.

These Continuous Quality Improvement (CQI) activities are becoming integrated into our college. We have presented them here as a background for our discussion regarding the application of a statewide Institutional Effectiveness Model to a specific college district within that state. The techniques presented here can be used in any situation where a college or university sees the need to coordinate an outside plan with an inside plan and present it in a fashion that will reinforce the three strengths of Hoshin planning: vertical alignment, horizontal coordination, and unit optimization.

THE CQI INSTITUTIONAL EFFECTIVENESS MODEL: HOW IT WORKS

As discussed earlier, the purpose of the statewide Institutional Effectiveness Model was to enable each college to measure how it was doing in meeting the 17 key indicators as set forth in the Wisconsin Technical College System Effectiveness Model document (November 1993). This model, developed by a task force of representatives of member colleges and facilitated by representatives of the Community College Consortium at the University of Michigan, defined effectiveness as: "An effective technical college is one that provides efficient educational programs and services that anticipate and respond to external and internal customer needs and result in outcomes that meet or exceed customer goals and expectations." Although the state model articulates the 17 key indicators of effectiveness, it leaves the development of each implementation of the model to the local college district.

The key element of the IE model at our college is the utilization of quality improvement tools. This is compatible with the strategic planning process of the college as well as the efforts of the college to implement CQI as approved by the MATC Board. The principal tool used is the Effectiveness Chart.

The Effectiveness Chart enables the college to accomplish several things.

- First, it enables the college to measure how well it is doing in meeting the 17 key indicators of the state model. (Or any other outside indicators).

- Second, it enables the college to measure the relative importance of each of the key indicators as they relate to our local college, its students, and other customers.

- Third, it enables the college to determine how it is doing in meeting the indicators as compared to other similar colleges who are excelling in indicator satisfaction.

- Fourth, it enables the college to continually monitor its progress in ongoing indicator achievement.

- Fifth, it provides the college with hard data for use in accreditation examinations that relate to effectiveness.

The following two additional process tools are used with the Effectiveness Chart: a Student Contact Chart and an Error-Mode-and-Effects Analysis. The Student Contact Chart will give the college the ability to look at every point in which the students that are served by the college come into contact with the college. This is crucial if the college is to identify possible areas for improvement.

The Error-Mode-and-Effects Analysis will give the college the ability to target improvement areas and determine the actual problem (error mode), the immediate and ultimate effect of that error, as well as perform an assessment of each error. This enables the college to prioritize its efforts to improve its level of effectiveness.

In this publication, we will outline how the CQI implementation model works.

Effectiveness Chart

The Effectiveness Chart can be broken down into several component elements (see Figure 1).

A. Indicators of Effectiveness: The ways to measure the effectiveness of an organization.

B. Methods: The ways in which the organization will become more effective.

C. Relationship between A and B: The area in which the relationship between "A" and "B" will be graphically shown.

D. Relationship between methods listed in B: The area in which the relationships between each of the methods in area "B" are graphically shown.

E. Rate of Importance: The quantitative evaluation of the importance of each of the key indicators.

Organization Now: How the college is currently doing meeting the indicators.

Benchmark: Quantitative evaluation on how other similar organizations are doing meeting the same indicators of effectiveness.

Plan: Quantitative evaluation of the current organizational plan to address the indicators of effectiveness.

F. Total: The sum of values found in each column of area "B".

%: The proportion of each column total divided by the total of all the columns.

Organization Now: The quantitative evaluation of how well the organization is doing what it says it will do.

Flag: A graphic representation of the progress the college is making in completing each method to satisfy the indicators.

Benchmark: Quantitative evaluations of the efforts of other similar organizations in doing the same method to satisfy the indicators.

G. Cumulative totals from "F": The cumulative total of the values found in area "F"

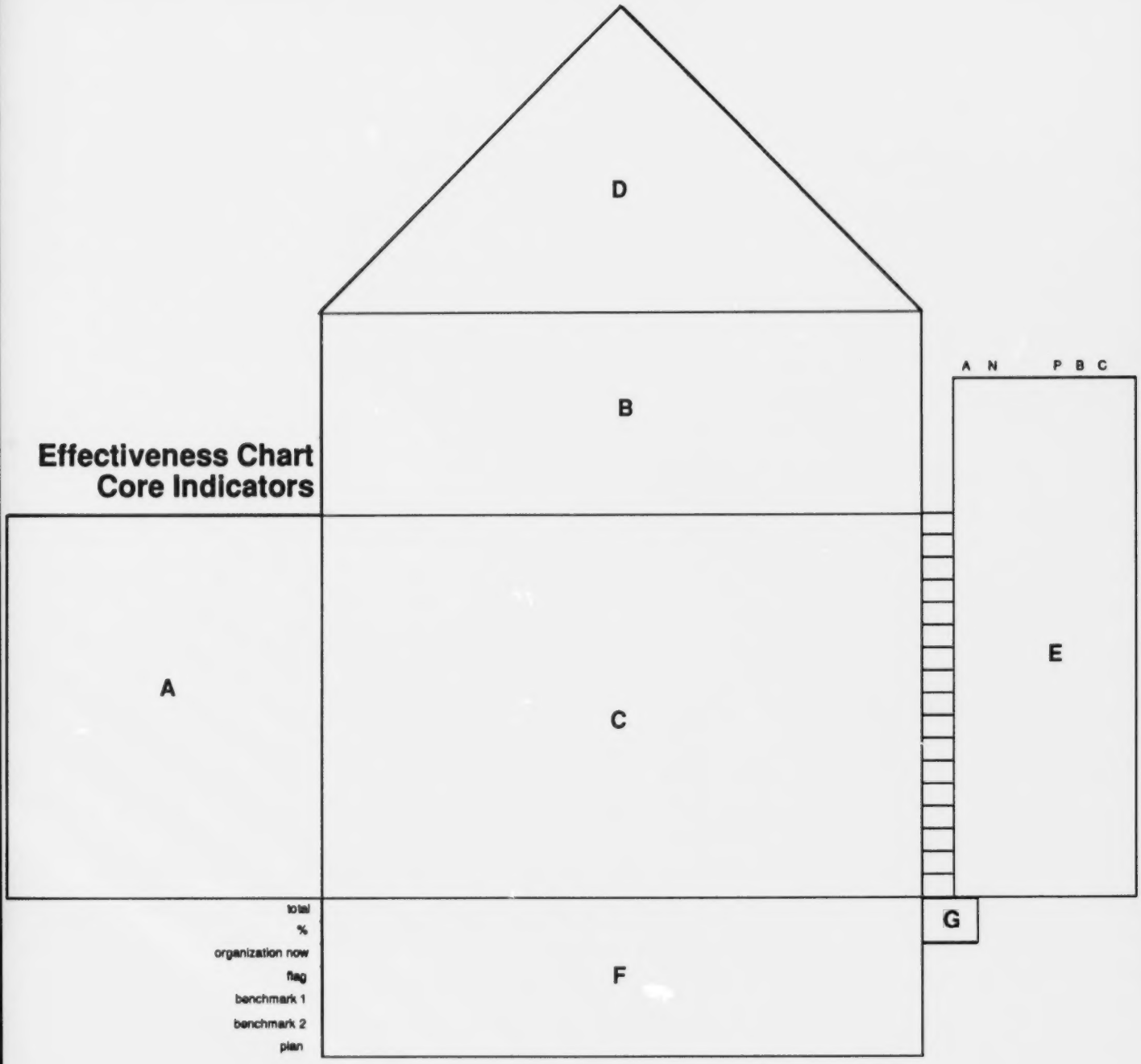

Figure 1:
Effectiveness Chart Template

Area A: This is the area where the indicators dictated by the outside plan are listed. In the case of our example, we will use the 17 indicators of the Wisconsin Technical College System Effectiveness model. (see Figure 2.)

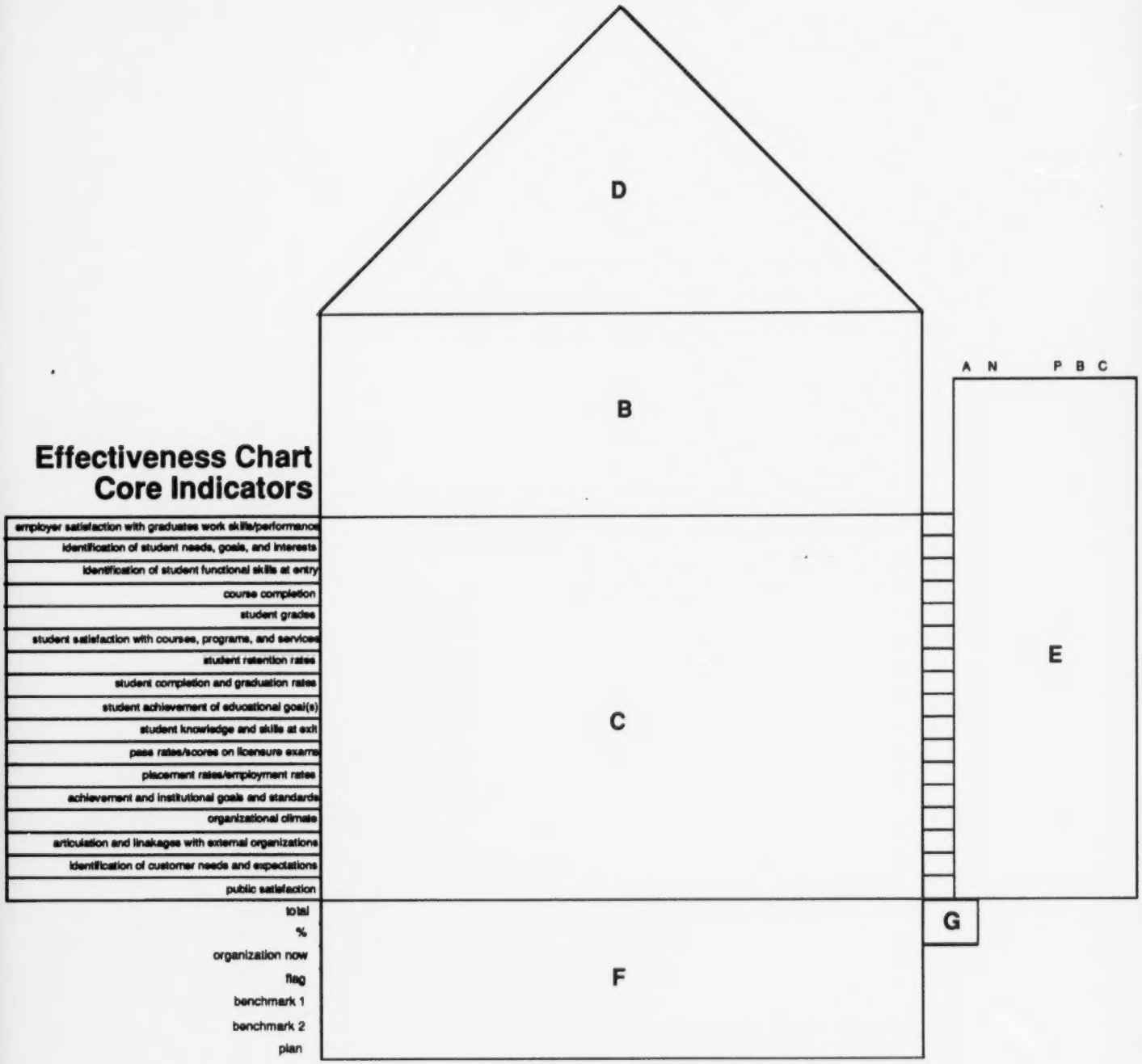

Figure 2:
Effectiveness Chart with Indicators of Effectiveness

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Area B: This area is used to list the methods in which the college will meet the indicators. These are the internal activities that are responding to the external indicators. In the case of our example, it is how the college will satisfy the 17 key indicators of effectiveness. This area is normally referred to as the "hows." (see Figure 3.)

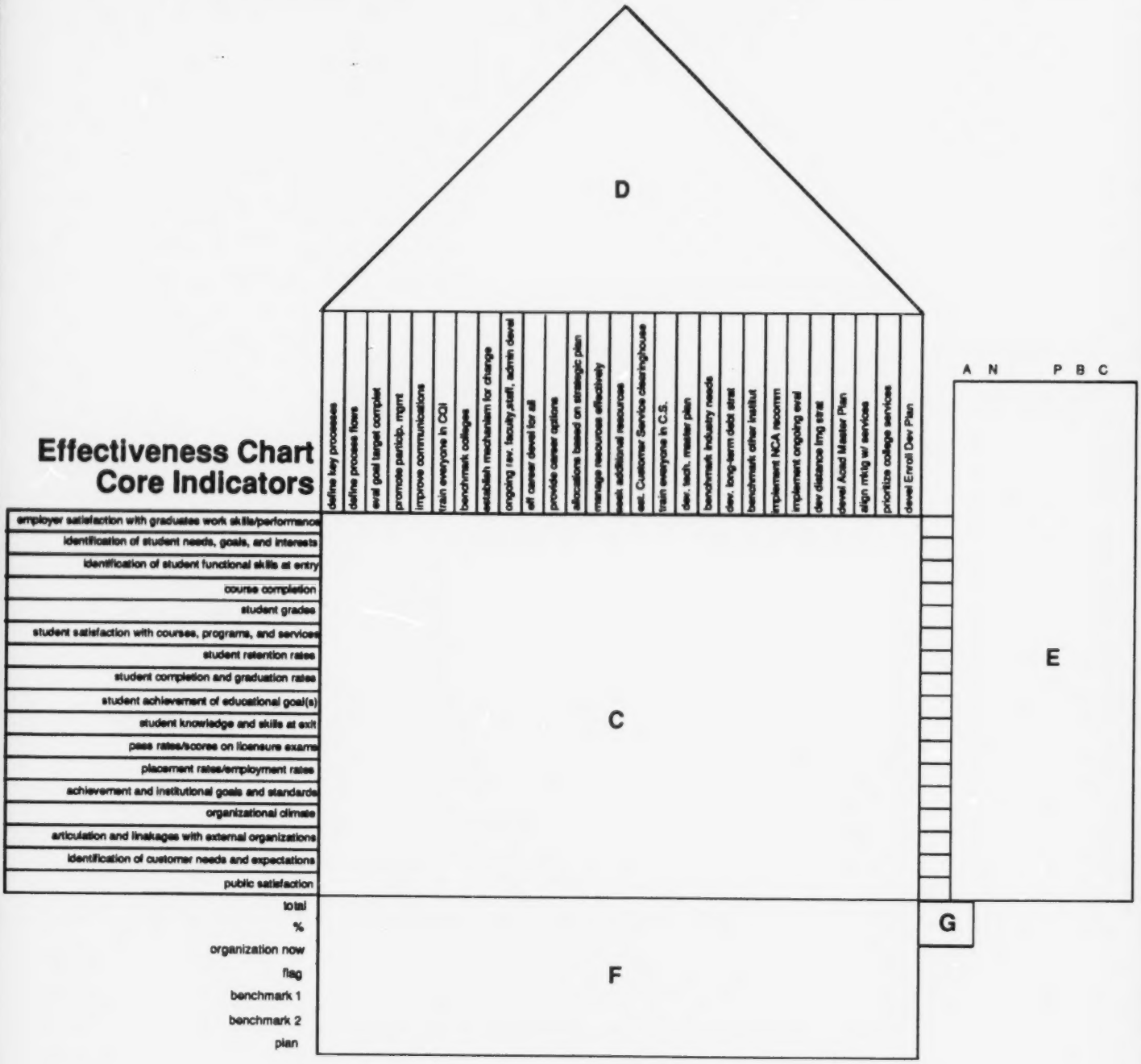

Figure 3:
Effectiveness Chart Template with Methods

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Area C: This the area that graphically shows the relationship of the information in "B" to the key indicators in area"A." This is the relationship between "how" the college meets the "whats." Each box is divided diagonally to permit both a graphic representation of the relationship and a quantitative representation. (see Figure 4.)

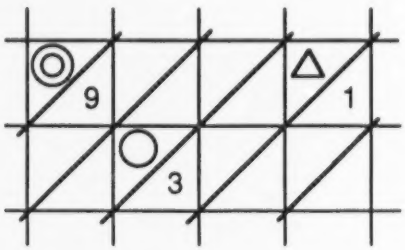

Figure 4: Area "C" sample

The graphic representation (symbol) shows one of three possible relationships: extremely strong, strong, and mild. The symbols are: a double circle for extremely strong, a circle for strong, and a triangle for mild.

◎ means there is an extremely strong relationship between the indicators (whats) and the activities (hows)

○ means there is a strong relationship between the indicators and the activities

△ means there is a mild relationship between the indicators and the activities

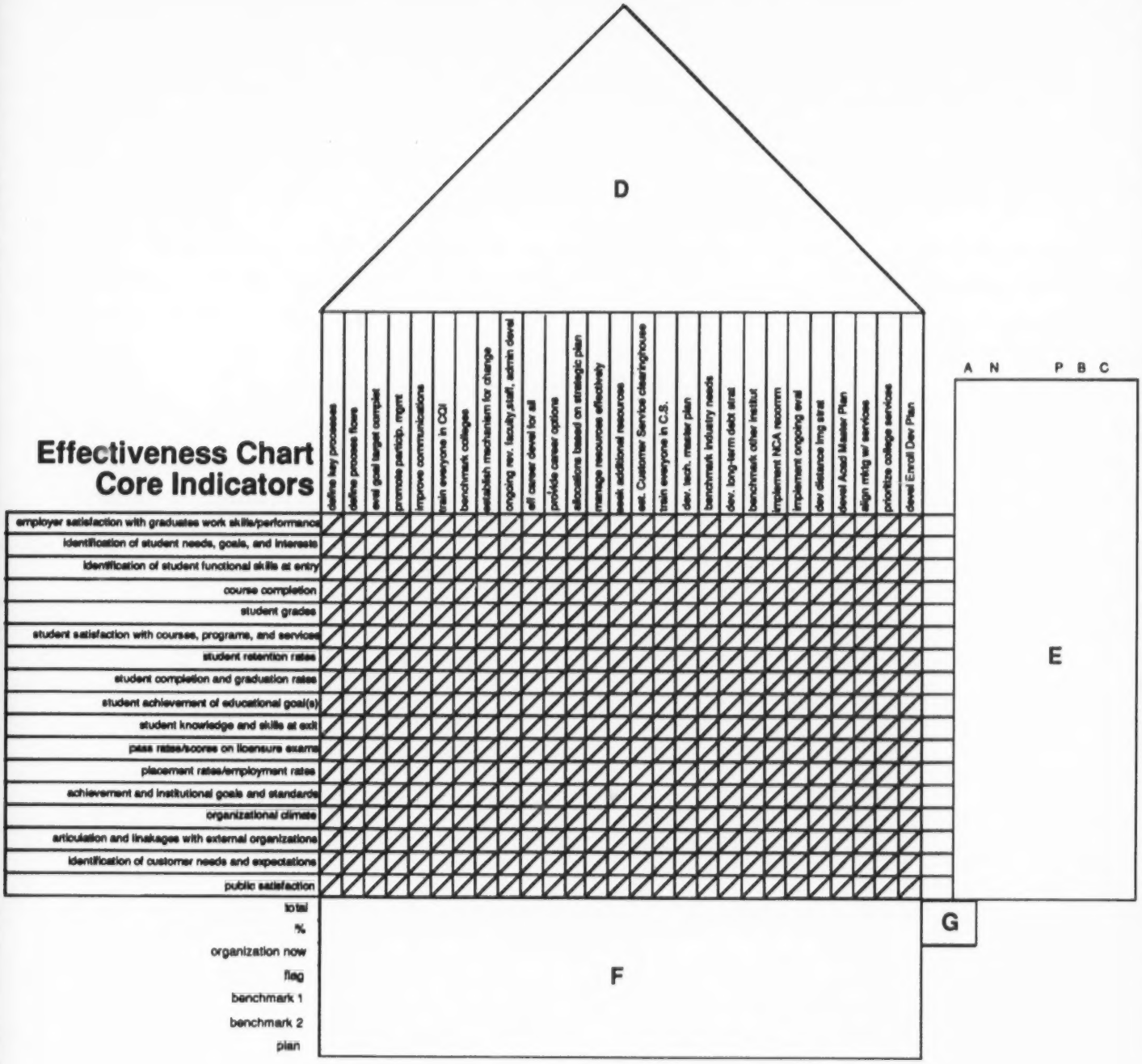

Figure 5:
Effectiveness Chart Template with Relationship between "A" & "B"

If there is a weak or no relationship between the data in area "B" and the key indicators in area "A," no symbol is placed in the appropriate box. (see Figure 5.)

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The numerical or quantitative value is a function of the value for the appropriate symbol times the rate of importance for that key indicator as determined by the college team. The quantitative values for each method found in area "B" are totaled vertically, with the resultant total value placed in the appropriate row total in area "F." These totals , when compared to each other, give a quantitative value for the relative strength of each method (area "B"). This will be discussed further in a later section of this publication.

Area D: This is the area that graphically shows the relationship between all of the "hows" found in area "B." This will be critical because some of the "hows" may have either a positive or negative effect on each other. This will result in either a gain or a loss from the effort. Gains, of course, will be positive and will result in a higher level of achievement. Losses will require a reassessment of that area of effort. The symbols used are the same as those used in area "C." (see Figure 6.)

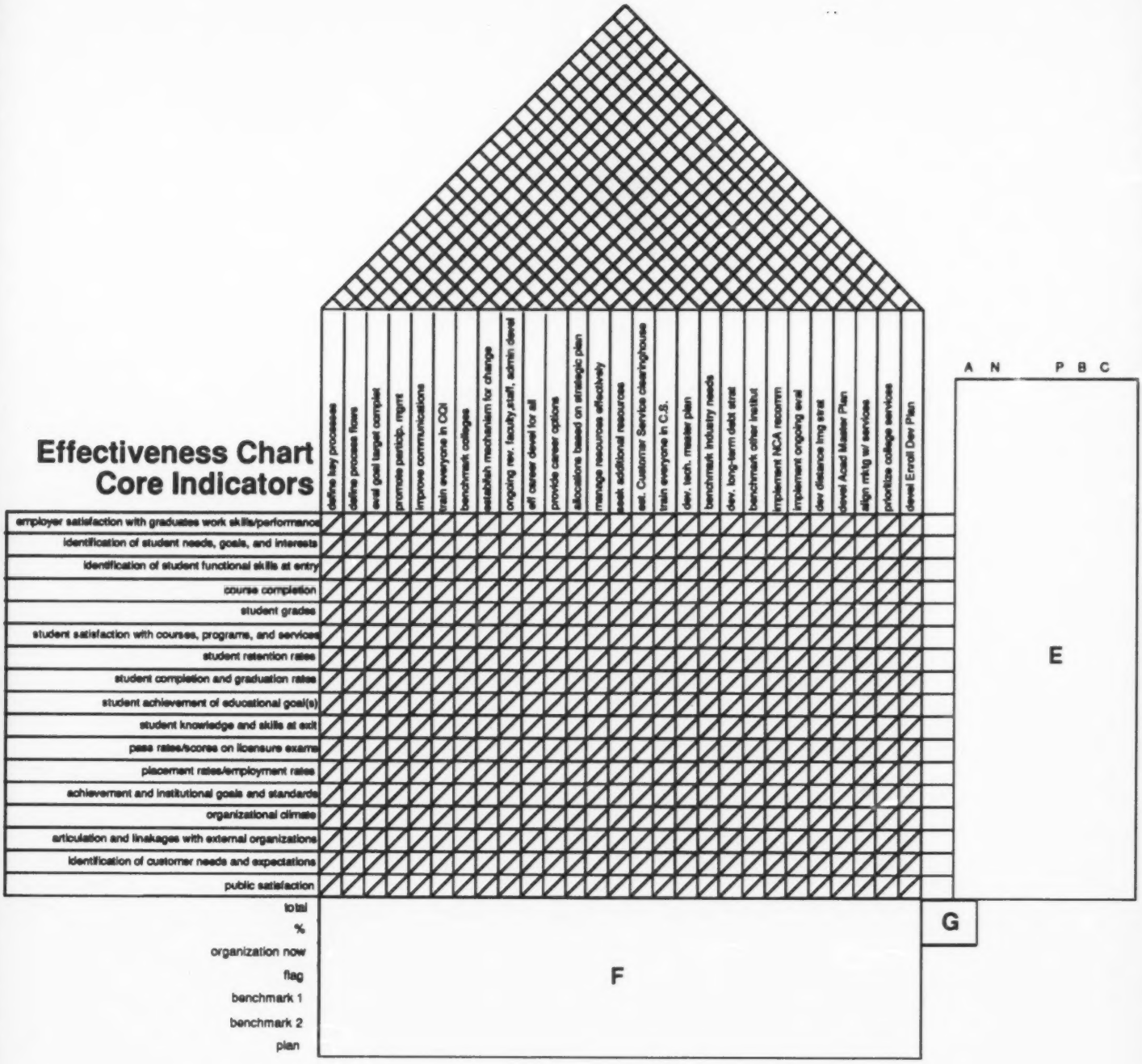

Figure 6:
Effectiveness Chart Template with Relationship Between Methods Listed in "B"

Area E: This area consists of several components .

- "**A**" is the "rate of importance". This is a quantitative evaluation of the importance of each of the 17 key indicators in the context of each college and its environment. At our college, this number was determined by our Center for Continuous Quality Improvement based upon information supplied by our Strategic Planning Steering Committee. The actual method of determining the rate of importance will vary from college to college. Assigning the "rate of importance" is a critical step in setting the college's priorities.

- "**N**" is the "Organization Now". This is a quantitative evaluation of how the college is currently doing in meeting the 17 key indicators. This preliminary assessment of how well we are meeting the key indicators is currently being done at our college by our Strategic Planning Steering Committee. The numerical scale is from 1 to 5 with 1 meaning the college is doing poorly and 5 meaning the college is doing well. By its very nature, this number is somewhat subjective and relative. Again, the actual method of determining the rate of importance will vary from college to college.

- "**Benchmark 1**" and "**Benchmark 2**" are available for quantitative evaluations of how other similar organizations are doing in meeting the same key indicators of effectiveness. The term "Benchmark" is used here in the CQI spirit to mean "best practices". The concept of benchmarking in higher education is new and often misunderstood. The processes discussed here can proceed even before the benchmarking is completed.

- "**Plan**" is a quantitative evaluation of the current plan to address each of the 17 key indicators. At our college this is done by the staff of our Center for Continuous Quality Improvement. The Center staff determines if the activities listed across the top of the chart (the hows) adequately address the "whats".

- "**Improvement Ratio**" is the ratio of the "Plan" divided by the "Organization Now".

$$\text{Improvement Ratio} = \frac{\text{Evaluation of the Current Plan}}{\text{Evaluation of How We Were Doing Before the Plan}}$$

This can be shown by the following formula:

$$B = \frac{P}{N} \qquad \text{or} \qquad B = \frac{\text{Plan}}{\text{Now}}$$

"Effectiveness Value" is the product of the "Rate of Importance" times the "Improvement Ratio." The purpose of this component is to further measure the efforts of the college in meeting the 17 key indicators. A high effectiveness value means that energies spent in this area are effectively meeting the indicators.

Effectiveness Value = Rate of Importance X Improvement Ratio

This can be shown by the formula:

$$C = A \times B$$

These values and ratios are shown in Figure 7.

Improvement Ratio

$$B = \frac{P}{N} \qquad \text{or} \qquad B = \frac{\text{Plan}}{\text{Now}}$$

Effectiveness Value

$$C = A \times B$$

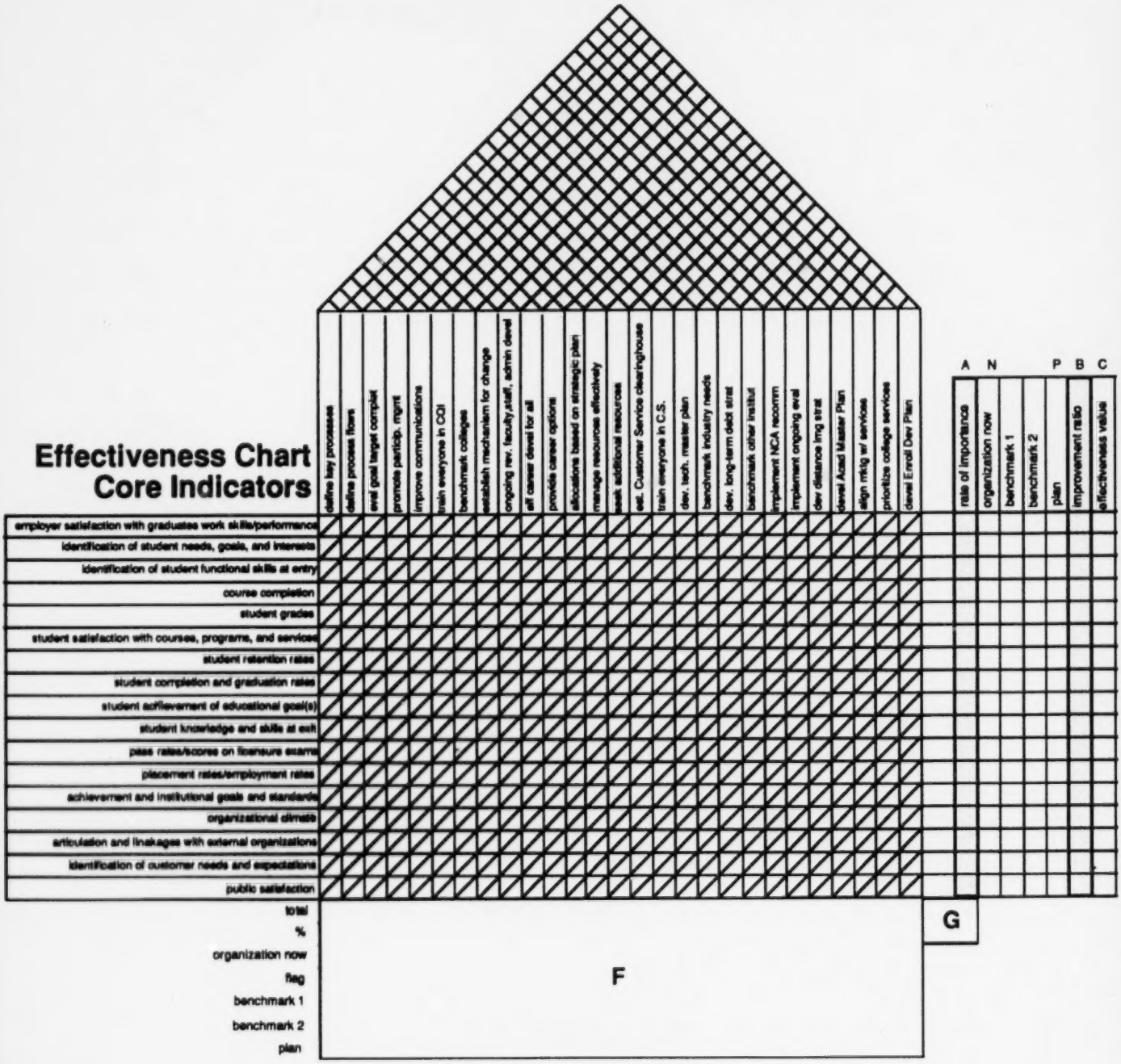

Figure 7:
Effectiveness Chart Template with Area "E" shown

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Area F: This area also consists of several component elements.

- "Total" is the sum of the values found in each column of Area B.
- "%" is the proportion of <u>each</u> column total divided by the total of <u>all</u> the vertical columns.
- "Organization Now" is a quantitative evaluation of how well the organization is doing what it says it will do (the "Hows" found in Area C).
- "Flag" is a graphic representation of the progress of the college in completing each method to satisfy the 17 key indicators.
- "Benchmark 1" and "Benchmark 2" are quantitative indicators of the efforts of other similar organizations in doing the same method to satisfy the 17 key indicators. (See Figure 8).

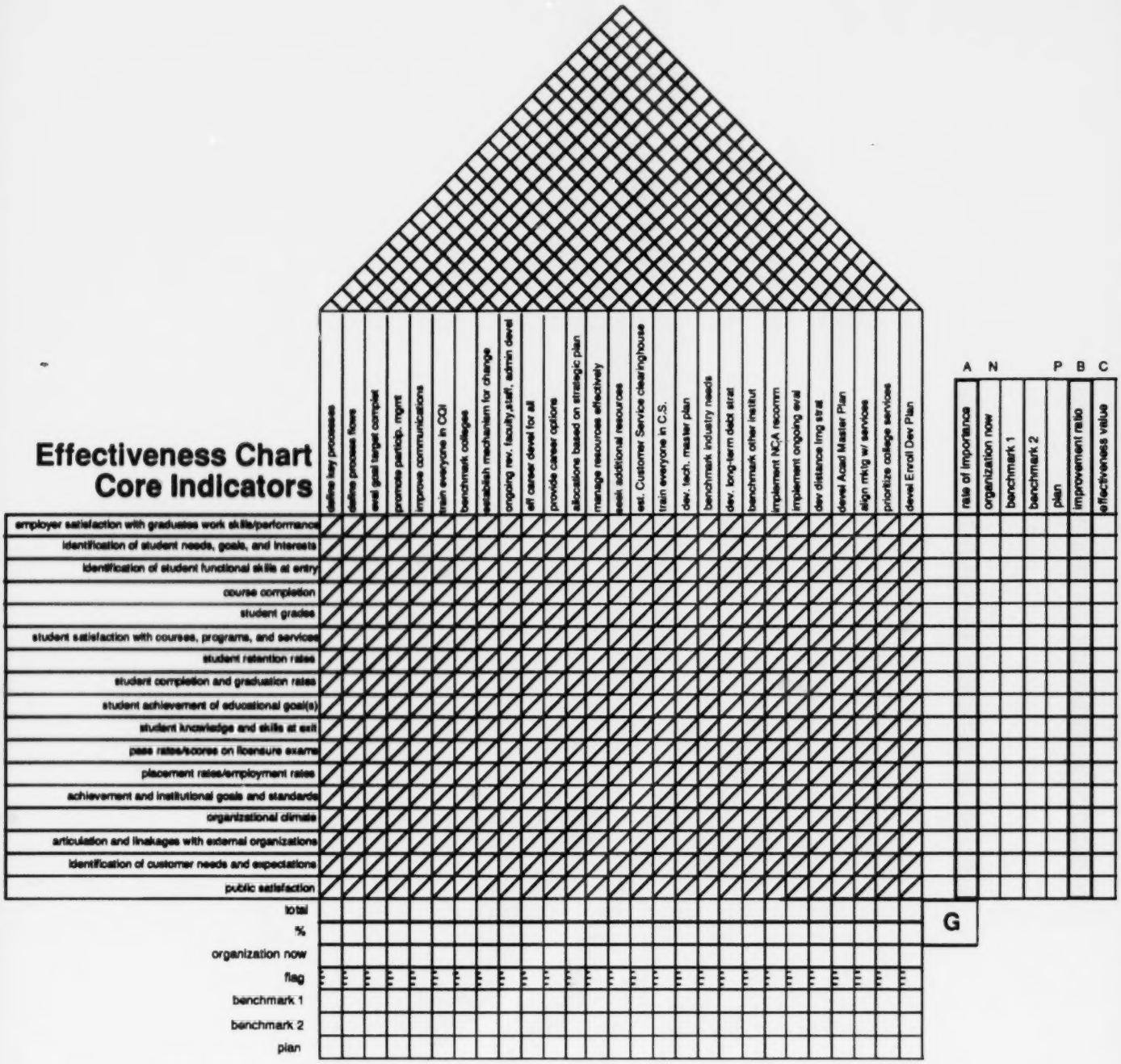


Figure 8:
Effectiveness Chart Template with Area "F" shown

Example

In this section we will illustrate how the Effectiveness Chart is to be completed. If you examine the Effectiveness Chart, you will see that the 17 indicators of institutional effectiveness are listed down the left side of the matrix and the institutional initiatives are listed across the top. The first activity in completing the matrix is to assign a ◎ (extremely strong relationship), a ○ (strong relationship), or a △ (mild relationship) or a blank (little or no relationship) to the upper triangle in each of the matrix boxes. These symbols are illustrated in Figure 9.

Symbol Relationships

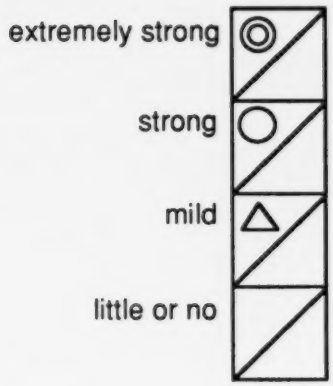


Figure 9:
Symbol Relationships

For illustration purposes, we have placed the symbols in the first row as shown in Figure 10.

	define key processes	define process flows	evaluate goal target completion	promote participative mgmt.	improve communications	train everyone in CQI
Employer satisfaction with Graduates work skills/performance	△		◎		○	

Note: These symbols are for illustration purposes only and do not represent the actual assignment of symbols at the author's college.

Figure 10:
Example of Symbol Placement

The following values have been placed on the matrix for illustrative purposes. These number values will always be arbitrary and only have significance as relative to each other. They should not be construed as "this value is 4" but rather as "four is twice as impactful as two." We have chosen a scale from 1 to 5, with 1 being least important or developed and 5 being most.

- **The Rate of Importance**: A=5
  (we have assigned a 5 to this item because it has been chosen by us to be among the most important of all the indicators)

- **The Organization Now**: N=3
  (we have assigned a 3 to this item because the current commitment to this activity appears to be moderate.)

- **Plan**: P=4
  (we have assigned a 4 to this item because the plan is an improvement over the current commitment but still not excellent.

When "P" = plan,
and "N" = organization now,
then the improvement ratio ("B") is calculated as follows:

The Improvement Ratio: **B=P/N=4/3=1.33**

When "A" = rate of importance,
and "B" = improvement ratio,
then the effectiveness value ("C") is calculated as follows:

Effectiveness Value: **C=AXB=5X1.33=6.67**

A	N			P	B	C
rate of importance	organization now	benchmark 1	benchmark 2	plan	improvement ratio	effectiveness value
5	3			4	1.3	6.7

Figure 11:
Area "E" with Values in Row 1

We will continue with the illustration of the effectiveness indicators in the first row of this matrix. On page 32, the numerical values for A, N, P were assigned, and the values for B, and C were calculated. This was done to illustrate the use of the matrix. The resultant values for "A," "N," "P," "B," and "C" have been placed in the first row of the matrix as shown in Figure 11.

The next step is to assign a relative numerical weight to each cell. This will indicate the relative importance of the cell to achieving the activity. In order to do this, the symbols are assigned numerical weights as follows:

◎ = 9

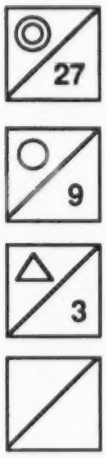
○ = 3

△ = 1

These numbers are then multiplied times the rate of importance for the row. In this case, we have assigned an importance of 5 to the row which generated the following values:

◎ / 45	**9 x 5 = 45**
○ / 15	**3 x 5 = 15**
△ / 5	**1 x 5 = 5**
/	**0 x 5 = 0**

For illustration purposes only, we will assign a rate of importance of 3, for the indicator in the second row. This will generate the following weights for the cells in row two:



9 x 3 = 27

3 x 3 = 9

1 x 3 = 3

0 x 3 = 0

Exercise: Assume that a rate of importance of 4 has been determined for the indicator in row three. Find the weights for each cell. (Place calculated weights in lower triangle of each square.)

These weights are shown in Figure 12.

For illustration purposes only, we will treat the 3 x 4 matrix shown in Figure 12 as though it were the complete "n x n" matrix. We will then total each column.

We have added the weights in each column and determined the % of the total.

(68+45+30+13=156)

After calculating the total, the percentages were determined as follows:

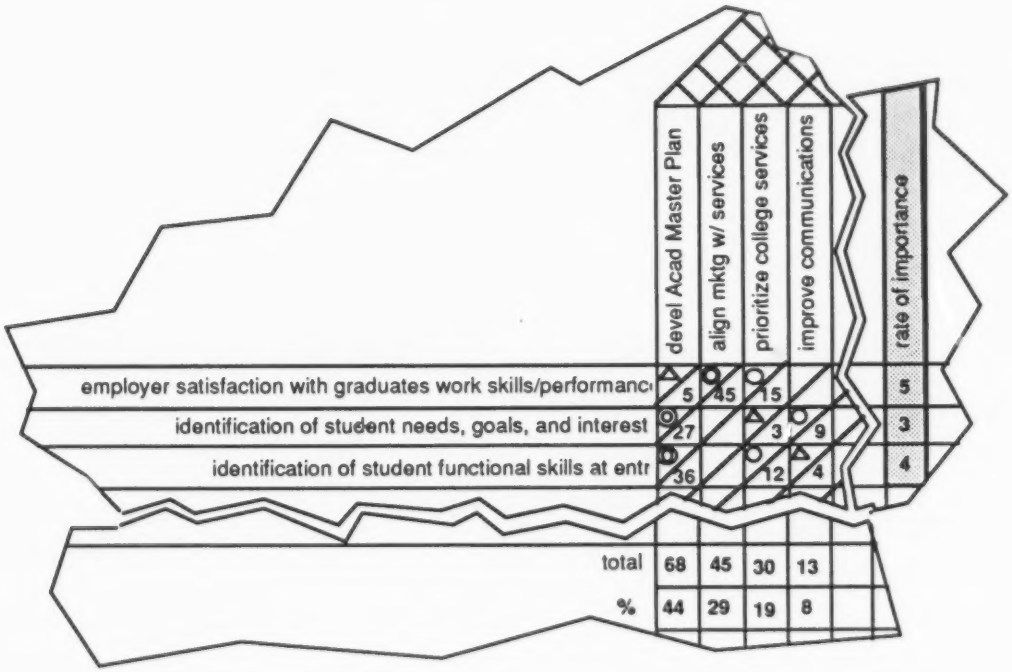
68/156=44%

45/156=29%

30/156=19%

13/156=8%

Area G: This area is solely for insertion of the cumulative total of the values in area F, row "Total"; as well as a cumulative total of the percentage values also found in area F. The cumulative total of percentage values may or may not equal 100 percent, based on the level of rounding off used by the participants.



	devel Acad Master Plan	align mktg w/ services	prioritize college services	improve communications		rate of importance
employer satisfaction with graduates work skills/performanc	5	45	15			5
identification of student needs, goals, and interest	27		3	9		3
identification of student functional skills at entr	36		12	4		4
total	68	45	30	13		
%	44	29	19	8		

Figure 12:
Effectiveness Chart Section with Values

When reviewing the numbers it is important to keep three things in mind:

- the symbols are necessary because they can give us a visual representation of where we should put our efforts:
- the numerical values are not absolute but, rather, relative;
- the symbols and numbers used in our example were for illustration purposes only.

The first column generated the largest total (68) and, therefore, the largest percent (44%). This, of course, makes sense because it represents two strong relationships and a moderate relationship. The second column also generated a large total (45) because it occurred in a row that had a high rate of importance.

The power of this is the ability to identify areas to work on that will have the most impact in satisfying the indicators.

COMMENT

The development of a program of Institutional Effectiveness will be key for any educational institution in both the near and far future. To ensure that the program is on target, specific tools are required. The Effectiveness Chart is one of those tools.

When used correctly, the Effectiveness Chart gives a college the ability to determine the relative strengths of various methods used to meet the needs of students and other customers. The product of this relationship and the priority of need should be viewed as relative value rather than a number.

The Effectiveness Chart also gives a college or university the ability to examine the relationship among the methods being used to meet the needs. This comparison of methods also gives the college or university the ability to look for additional implementation leverage. A method, therefore, that has multiple positive relationships with other methods may be more significant than one that has a higher relative value but fewer positive relationships.

The development of an Effectiveness Chart may be seen as difficult work. The work should be viewed in the context of lost potential or misdirected action for the college or university. The actual development of an Effectiveness Chart is accomplished in a short period using Institutional Effectiveness groups.

STUDENT CONTACT POINT CHART

Another quality tool that is helpful in the institutional effectiveness assessment is the Student Contact Point Chart. This chart is usually developed by the same team that develops the Effectiveness Chart. The Student Contact Point Chart is a graphic representation of every point in which students come in contact with the processes of the college. These contact points would begin with the first contact and end with the final contact. Many of the contacts can happen simultaneously and, therefore, a simple flow chart will not suffice. The format for a flow chart is used to track the major sequential contact points. This flow chart follows traditional quality improvement flow chart rules.

It is significant from a customer service perspective that each contact point on the chart is a "moment of truth;" a time and place in which the student makes an evaluation of the college. These contact points are critical to the student's evaluation of the college and can be thought of as potential "failure points". A "failure point" is a time and place where a student may make a conscious decision to either continue at the college or leave. Each failure point is indicated by F_n. (See Figure 13.)

Student Services Contact Points

- f01 Counseling
- f02 Student Activities
- f03 Track I
- f04 Track II
- f05 Bridge to Success
- f06 Orientation
- f07 Family-Womens Center
- f08 Multi-Cultural Affairs
- f09 Information Center
- f10 Financial Aid
- f11 Special Needs
- f12 Registration
- f13 Child Care
- f14 Information Desk
- f15 Admissions
- f16 Enrollment
- f17 Advising
- f18 Testing
- f19 Follow-up
- f20 Employment Development
- f21 Outreach

Figure 13:
Sample of Student Contact Point Chart

ERROR MODE AND EFFECTS ANALYSIS

Once these failure points are identified they can be analyzed using an Error Mode and Effects Analysis (EMEA). The EMEA is a tool that is shown in Figure 14. There are 12 vertical columns in the EMEA. This is described below:

- **Fail Point**: This column contains the potential failure point indicators.

- **Action Step**: This column contains the action step in which the student makes contact with the college.

- **Immediate Error Effect**: This column contains the short term, or immediate effect on the institution if contact with the student results in a failure.

- **Ultimate Error Effect**: This column contains the long term, or ultimate effect on the institution if contact with the student results in a failure.

- **Cause of Error**: This column contains the root cause of the error situation. It is crucial that the information in this column does not reflect the symptom of the error, but the actual root cause of the error.

- **Method of Detection**: This column contains the means in which the college will know that an error has happened, causing a potential failure.

- **Frequency**: This column shows how often the failure point results in an error. This value is usually based on a 1-5 scale, with 1 representing minimal failure point effect and 5 representing maximum failure point effect.

- **Severity**: This column contains value indicating how severe the error is in its effect on the college's mission of meeting the needs of the students. The value range is also 1-5, with 1 representing minimal severity and 5 representing a very severe situation.

- **Score**: This column in the product of frequency times severity times determination. This product represents a relative assessment of the error situation and can be used to set priorities for identifying how critical the potential errors may be.

- **Error Mitigation**: This column contains the information describing how to minimize the effect of the potential error. It is, in fact, a contingency plan to deal with the error.

INTERPRETATION OF ERROR MODE AND EFFECTS ANALYSIS (EMEA).

The power of an EMEA is that it provides the planning group the ability to determine the most appropriate points for intervention to reduce and/or eliminate errors that are experienced by the students.

After the completion of an EMEA, the appropriate intervention points can be quickly identified by looking at the data in the Score column. It is critical to remember that the values found in this column are relative and only significant when compared to other values found in this column.

Using the EMEA in Figure 14 as an example, the appropriate error to address would be found in F03, *Do Not Follow-up on Fails*, because the data in the Score column is the highest relative to the other scores. This does not imply that other errors should not be addressed, only that this error should be addressed first.

Error Mode and Effects Analysis

Fail Point	Action Step	Error Mode	Effect of Error		Cause of Error	Method of Detection	Assessment				Error Mitigation
			Immediate	Ultimate			freq.	sev.	det.	score	
f03	administer ASSET	do not follow-up on fails	lose student	lost FTE's	insufficient personnel	program admiss report	8	8	5	320	hire part-time staff, redistribute workload
f07	purchase books	books not available	frustration, inconvenience, student falls behind	drop-out, refund required, lost FTE's	books not ordered by A.D., books ordered late	student complaint	3	10	10	300	better book ordering system
					books not available from publisher	student complaint	2	10	10	200	print in Bindery with permission from publisher
					overloaded class	student complaint	3	10	10	300	put additional students in later section
					wrong books ordered	student complaint	2	10	10	200	verify appropriate book ordered,print in Bindery with permission from publisher
f13	student counseling	do not advise P-T students	students mis-directed, not motivated	lost FTE's	insufficient personnel	P-T retention report	6	6	8	288	hire part-time staff, redistribute workload

Figure 14:
Error Mode and Effects Analysis Sample

MITIGATION PLAN DEVELOPMENT

The development of plans to deal with errors can be done by a team using quality improvement process tools with the actual plan being articulated in an implementation tree diagram. This diagram would show the following:

1. specific action steps to be taken to reduce and eventually resolve the error,
2. the measure of success,
3. the responsible person for the implementation of each action step,
4. the timeline for implementation,
5. the way in which the college will see resolution (the vehicle).

SUGGESTED IMPLEMENTATION

An Institutional Effectiveness Implementation Model should be developed to assist a college to become more effective in its ability to address key indicators established by an outside source.

One way this model may be implemented is as follows:

- A cross-sectional team would be developed to address the issue of Institutional Effectiveness at the college. The team would be composed of representatives of administration, staff, faculty, students, and external customers of the college. The team would have 12-20 members.

- A trained facilitator would be assigned to work with the Institutional Effectiveness team to ensure that the team would be able to work effectively. The trainer would have been trained in the model and the tools with which the model functions.

- The team would identify additional input populations that may be used as focus groups. This would help ensure that adequate, factually-based information was available to the IE team.

- The team would complete areas A, B, C, D, and E of the Effectiveness Chart.

- The team would identify the points in which students come in contact with the college in the Student Contact Point Chart. Next, potential failure points would be identified and noted.

- An Error Mode and Effects Analysis would be completed for each potential failure point. This would be done by the team, with input from focus groups composed of people who have specific expertise in a given area.

- The balance of the Effectiveness Chart would be completed.

- The Institutional Effectiveness (IE) team would monitor the progress of the college IE plan as it relates to key indicators. In this process, the team would be able to add specific key indicators that it feels would be appropriate to improve the effectiveness of the college.

- The team must report to the president on the progress of the college on a semi-annual basis.

IMPLEMENTATION RATIONALE

The rationale for the development of this implementation model is that each college or university is unique and each of the colleges in the Wisconsin Technical College System is also unique. Each college has different environmental, fiscal, governance, geographic, and demographic issues affecting its ability to effectively meet the needs of the students. It is, therefore, critical to develop a model that has the flexibility to adapt to differing situations of each college.

Although a specific application was used here to demonstrate the tools, the techniques are generalizable to other applications where internal planning must respond to external indicators.

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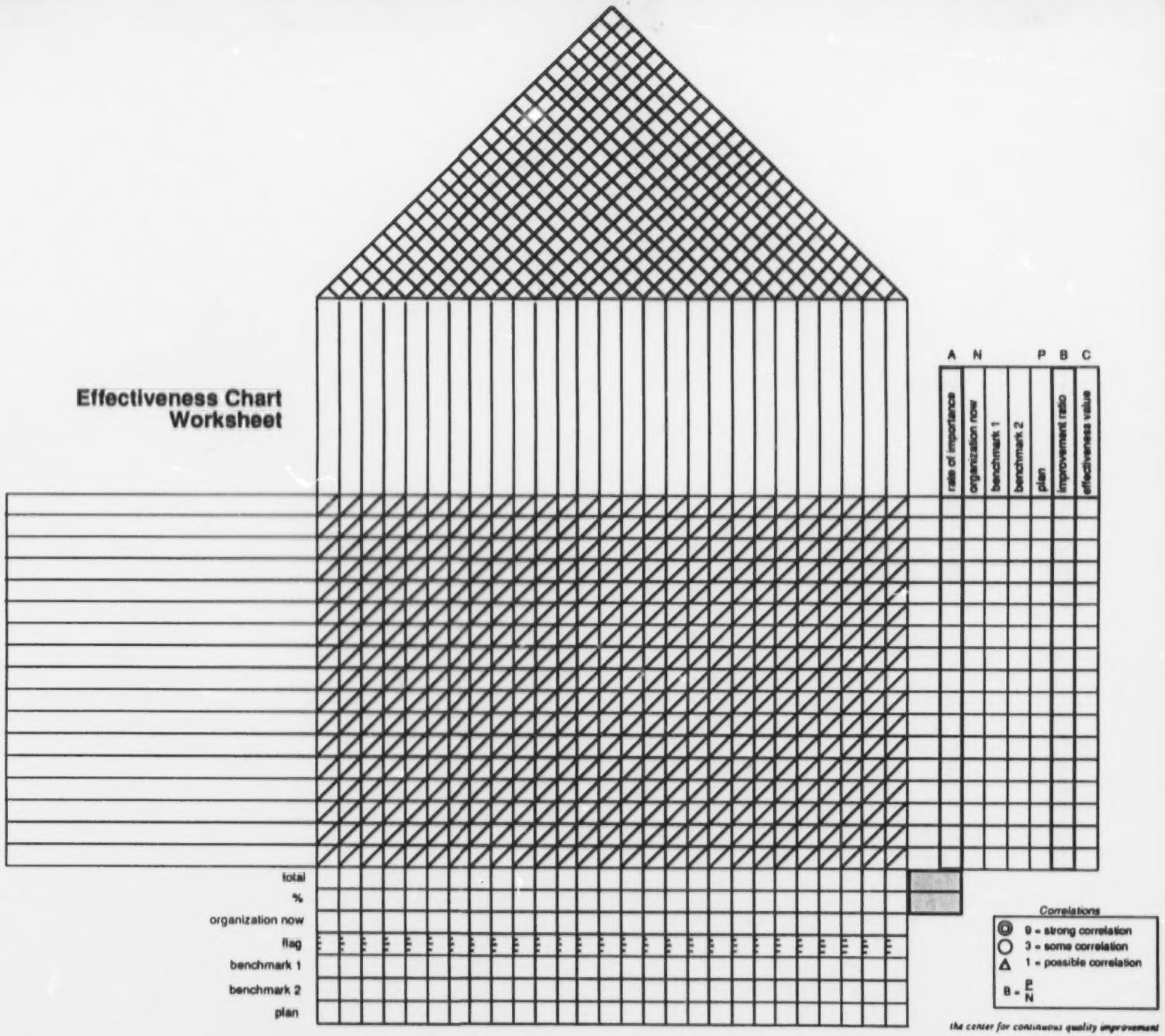
Effectiveness Chart Worksheet



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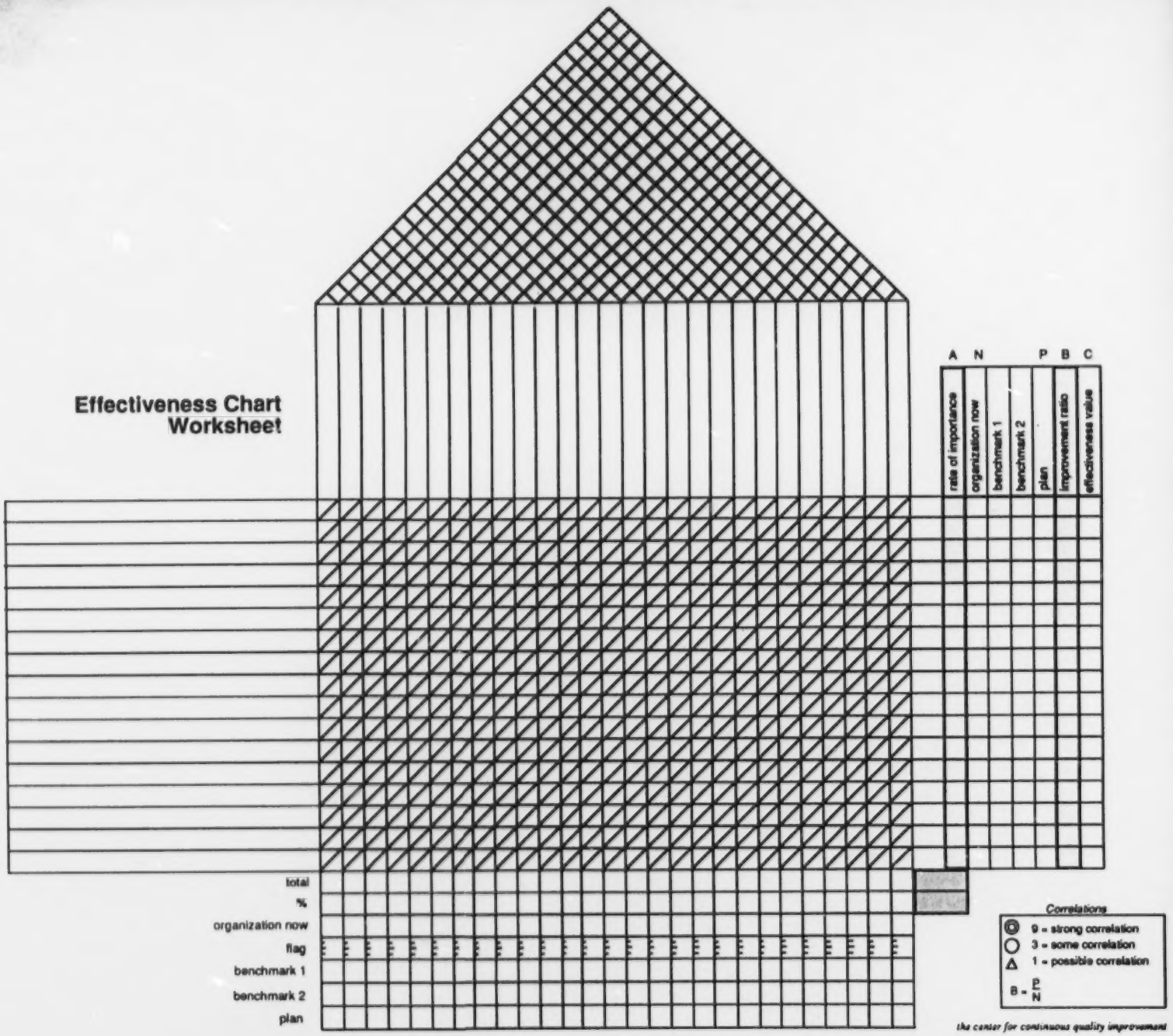
Effectiveness Chart Worksheet



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